

UK Patent Application GB 2 315 041 A

(43) Date of A Publication 21.01.1998

(21) Application No 9614110.6

(22) Date of Filing 05.07.1996

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(51) INT CL⁶
B31B 1/90

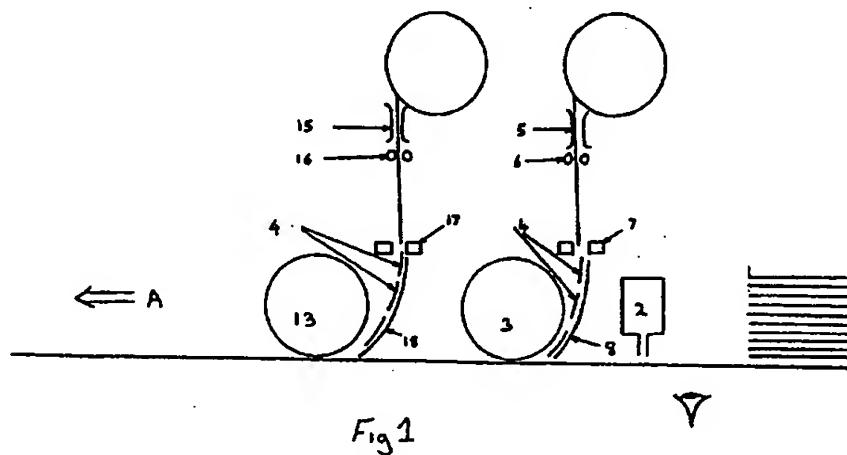
(52) UK CL (Edition P)
B5D DA17

(56) Documents Cited
GB 2143802 A

(58) Field of Search
UK CL (Edition O) B5D DA17 DA2 , B8M MB10
INT CL⁶ B31B 1/90 , B65H 35/04
Online : WPI

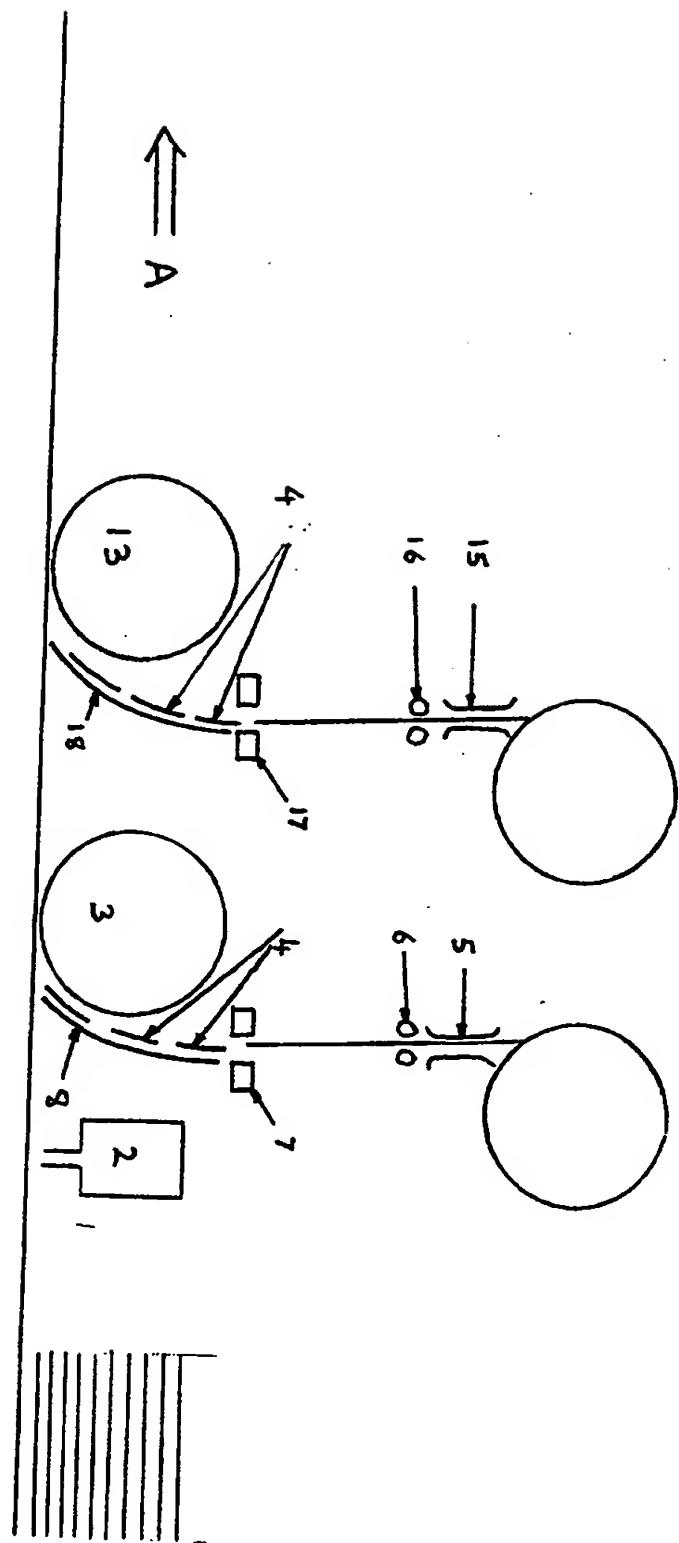
(54) A method of applying a cutter tape and apparatus for use in the method

(57) A method of applying a serrated cutter tape 4 to a moving carton blank, the method involves applying a cutter tape 4 to a blank such that the tape 4 is kept continuously moving. The cutter tape 45 comprises a continuous strip which is feed through a cutter block 7, 17 where sections are cut from the continuous strip prior to being affixed to a carton blank with adhesive. Two applicator assemblies may be provided so that while the first applicator assembly is applying cutter tape to a carton blank the second applicator assembly can be reloaded with a spool of cutter tape and vice versa. The longitudinal axis of the tape is generally parallel to the direction of movement of the carton blank.



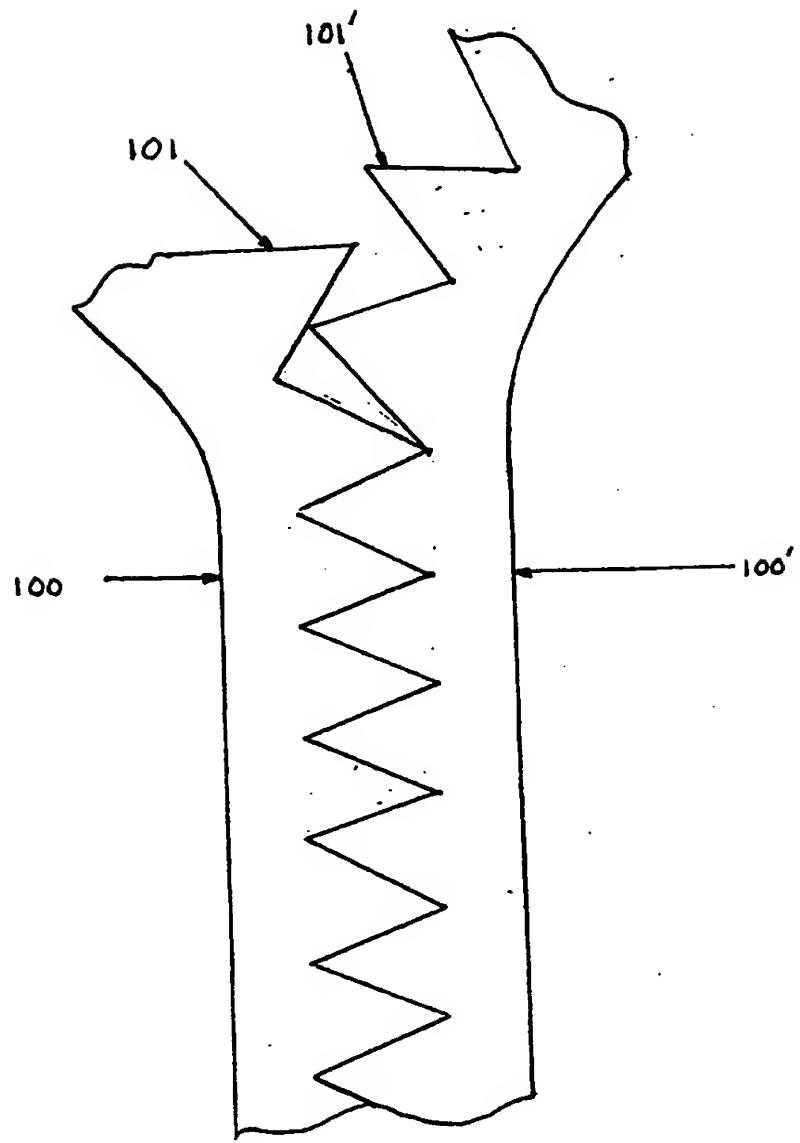
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Fig. 1



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Fig 2



A method of applying a cutter tape and a machine for use in the method

This invention relates to a method of applying a cutter tape to a carton blank, making a carton to which a tape has been applied and a machine for use in the methods. More especially, but not exclusively, the invention relates to a carton having a cutting strip for cutting sheet material such as 'cling film', metal foil and paper. Cartons for sheet material are commonly provided with a serrated or sharp cutting edge to aid cutting of the material. The cutting edge is rather difficult to apply at high speed. Two methods are often used. In the first a sheet of tough plastics material is cut into serrated strips and glued to the reverse face of a blank. The blank is then erected in the usual way and filled. The reverse face of the blank is rough and thus the strip moves quite slowly over it. This causes a bottleneck in production. Attempts have been made to reduce the bottleneck by providing an 'extra' part panel that is folded with the smooth face inside the complete carton. The reduction in friction allows the strips to be applied more rapidly. Against this advantage must, however, be traded the cost of the 'extra' board. Neither process is thus satisfactory. The invention seeks to at least reduce the problems associated with the prior art.

The invention flows from the realisation that one can supply the cutter tape in a strip which is continuously moving to blanks substantially parallel to the movement of the blanks. Since conventional gluing machines operate with continuous movement it is straightforward for the worker skilled in the art to modify them to produce a machine which both applies the cutter strip and performs conventional gluing operations. The invention is not however to be regarded as restricted to such machines.

According to an aspect of the invention there is provided a method of applying a cutter tape having a longitudinal axis to a carton blank the method comprising the steps of

i moving the blank relative to an application zone in a first direction

ii applying the cutter tape to the blank

wherein the longitudinal axis of the tape is generally parallel to the first direction.

According to the invention there is further provided apparatus for applying a cutter tape having a longitudinal axis to a carton blank, the apparatus comprising

i means for moving the blank relative to an application zone in a first direction,

ii means for applying the cutter tape to the blank generally parallel to the first direction.

Embodiments of the invention will be illustrated by way of non-limiting example by reference to the accompanying figures of which:

Figure 1 is a side elevation of an applicator of the invention and

Figure 2 is a view of a tape cut for use in the invention.

According to the illustrated embodiment of the invention blanks are cut, for example in a conventional die cutter (not shown). In general terms the blank

will be assembled for example by gluing in such a way that in a later operation it will erect into an quadrilateral prism. Other shapes are within the scope of the invention. It is not necessary to provide the 'extra' half panel hereinbefore referred to since there may be little movement of the tape over the blank surface and has little friction. No extra benefit is likely to accrue if the half panel is provided. If desired it can however be provided.

The blanks are typically loaded into a gluer or other continuous feed machine. With the exception of the features hereinafter described a conventional, continuous feed gluer can be employed. The blanks are arranged with the edge which will bear the cutter strip or tape parallel to the machine direction rather than perpendicular as has, it is believed been used hitherto in the art. One by one the blanks are drawn from the pack of blanks and traversed through the machine in direction A.

In the illustrated embodiment each carton is detected by an optical sensor 1. Those skilled will have no difficulty in devising other suitable sensors or arrangements in which the sensor can be omitted. In the embodiment adhesive, for example hot melt adhesive, is applied from applicator 2 along the edge of the blank to which the tape is to be applied. It is not essential to secure the tape using adhesive but this is convenient since as noted gluing machines are generally continuous feed machines.

As will be apparent from the description hereinafter the precise method by which tape is applied is not of the essence of the invention although the tape should be applied substantially parallel to the machine direction. An applicator wheel 3 preferably resiliently biased towards the blank applies cutter tape 4 to the blank. The cutter tape is supplied in a direction generally parallel to the machine direction A. The blank is then glued where it is passed

out as a folded edged and glued carton in the same operation. The content is inserted and the carton sealed and packaged.

The supply of tape 3 to the applicator 3 (which need not comprises a wheel but could for example be a reciprocating foot) is of some importance to the performance of the invention. In principle paper, plastics or metal sheet could be nibbled into strips. In this case the tape strips might be supplied from a hopper. It is however much preferred to have a continuous supply of tape which is cut just before or even just after application. A preferred arrangement is illustrated in Figure 1. As illustrated, a continuous tape strip with serrations along at least the working edge thereof is passed through input guide 5. The tape strip is driven by a pair of feed wheels 6 conveniently biased together by a resilient bias (not shown). The strip passes through a cutter block 7 where sections are cut from the continuous strip. The tape enters an output guide 8 that guides the strip generally parallel to the plane of the traversing blank. The machine can operate at speeds similar to that of a conventional gluing machine. The machine might, for example, process between 10 and 17 000 blank per hour. Operating at a speed of 17 000 blanks per hour and applying tapes of the common length of 0.275m require around 78m of tape per minute. It will be apparent therefore that even a large spool of tape will soon be exhausted. In preferred embodiments of the invention two applicator assemblies will be provided. A second assembly downstream of the first and provided with an input guide 15, feed wheels 16, cutter block 17, output 18 and applicator 13 is preferably present. While the first applicator assembly is applying tape the second can be reloaded and *vice versa*.

The tape described above can be obtained by butting a broader tape into two portions with a serrated rotary cutter. Two tapes 100 and 100' each with teeth 101 and 101' on one edge thereof are formed. Teeth are obtained only on the

the working edge. In comparison in prior art techniques teeth are formed on two edges of the tape and thus half the cutting effort is wasted.

It will be apparent to those skilled in the art that the described embodiments are for the purpose of non-limiting illustration. Those skilled in the art will have no difficulty in modifying the invention.

Claims

1. A method of applying a cutter tape having a longitudinal axis to a carton blank the method comprising the steps of

i moving the blank relative to an application zone in a first direction

ii applying a cutter tape to the blank

characterised in that the longitudinal axis of the tape is generally parallel to the first direction and in that the tape is continuously moving.

2 A method as claimed in claim 1 wherein the cutter tape comprises a continuous strip cut before application in a cutter.

3. A method as claimed in claim 1 or claim 2 wherein adhesive is applied to the blank and the tape pressed onto the blank by an applicator wheel.

4 A method of applying a cutter strip to a blank substantially as hereinbefore described by reference to either of the accompanying figures.

5. A method of making a carton comprising the steps of

a applying a cutter to a blank as claimed in any one of the preceding claims, and

b folding and gluing the blank to form a carton.

7. A carton blank obtained by a method as claimed in any one of claims 1 to 4.

8. A carton obtained by a method as claimed in claim 6.
9. Apparatus for applying a cutter tape having a longitudinal axis to a carton blank, the apparatus comprising
 - i means for moving the blank relative to an application zone in a first direction,
 - ii means for applying the continuously moving cutter tape to the blank generally parallel to the first direction.
10. Apparatus as claimed in claim 9 wherein means for supplying a continuous strip of tape to a cutter for cutting the tape into lengths is provided.
11. Apparatus as claimed in claim 9 or claim 10 further comprising means for applying glue to one of the blank and tape and an applicator for pressing the tape onto the blank.
12. Apparatus as claimed in any one of claims 9 to 11 further comprising a sensor for example an optical sensor for sensing the position of a blank.
13. Apparatus as claimed in any one of claims 9 to 12 comprising two application zones.
14. Apparatus as claimed in claim 13 further comprising a rotary cutter for cutting a slice of a roll of plastics material into serrated tapes.
- 15 Apparatus for making a carton having a cutter tape comprising

a means for applying a cutter to a cutter blank as claimed in any one of claims 9 to 14 and

b means for folding and gluing the blank into a carton.



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Application No: GB 9614110.6
Claims searched: 1-15

Examiner: Paul Makin
Date of search: 5 September 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B5D (DA2, DA17) ; B8M (MB10)

Int Cl (Ed.6): B31B 1/90 ; B65H 35/04

Other: Online : WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2143802 A (WADDINGTONS LIMITED) See particularly line 123 on page 2 - line 44 on page 3.	1-15

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.